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Editorial:
Natural disasters and the age of the Earth

As I write this editorial, the news headlines are still focused on the devastation caused in Sichuan Province, China, by the May 2008 earthquake and in the southern regions of Burma by Cyclone Nargis. Our lead article about the aftermath of Typhoon Durian in the Philippines is therefore very timely. As David Tyler explains in his article, such catastrophic events challenge conventional thinking about geological timescales and our assumptions about the 'normality' of present-day climatic conditions. However, these natural disasters raise another important question: if, as the Bible says, there is a God of love and compassion, why do such disasters happen at all?

The Bible's answer to this question is to point us to the Fall of man, which introduced death and bloodshed into God's perfect world. Adam's rebellion against God brought a curse upon the creation and, in Adam, we all ultimately die. In the words of the apostle Paul, "by one man sin entered into the world, and death by sin; and so death passed upon all men, for that all have sinned" (Romans 5:12). Indeed, it is at this very point that we are confronted with the central issue that makes the creation message so important. According to conventional reconstructions of history, death and bloodshed have been around for millions of years – long before man even appeared on the Earth. But if we accept the conventional reconstructions, then in what meaningful sense can death and bloodshed be regarded as the consequence of sin?

This question has serious implications for the gospel message – because the very meaning of Christ's death on the cross is inextricably linked with the actions of Adam in Genesis chapter three. The reason that Christ had to die to redeem his people was because the shedding of blood was required for the remission of sin. Death, bloodshed and disaster came about as a result of human rebellion in Eden. Agony and suffering are intruders into God's creation and will one day be banished forever when Christ returns to establish the new heaven and the new earth (Revelation 21:1-4). It is not possible to reconcile this history of death with the conventional history of death. What is more, the acceptance of death and bloodshed before Adam torpedoes any attempt to formulate a consistent biblical response to the problem of suffering. If death and bloodshed have always been a part of the created order – if they were described as "very good" in the beginning – then God himself must be regarded as their author and we are left wondering why the New Testament would describe death as "the last enemy" (1 Corinthians 15:26). The question of the age of the Earth is not unimportant or irrelevant – rather, the theological implications are deep and profound.

The Bible also reminds us that, "Precious in the sight of the LORD is the death of his saints" (Psalm 116:15). Many of our readers will have known Brian and Christine Austin, who ran the Mustard Seed Bookshop which sold creationist literature on the Kentish Town Road in London. They had a long and fruitful ministry, especially among those unreached by the traditional evangelical churches. In his ministry, Brian always emphasised the need for the renewal of the mind as well as the heart. He was keen to take the gospel to thinking sceptics and to meet them on their own ground. He was respected by them as a person of integrity, even when they disagreed with everything he stood for. Sadly for us, following a short illness, Brian went to be with the Lord in August 2007. Do remember Christine in prayer as she adjusts to life without her beloved companion and helpmeet.

Paul Garner

Origins 48

Corrections to *Origins* 46 and 47

In *Origins* 46, we carried the personal story of retired pastor Bob Allen. Unfortunately, some errors were inadvertently introduced to the article's preface at the editing stage, and we would like to set the record straight here. Bob was most recently the Senior Pastor of Billericay Baptist Church and on the team of Gold Hill Baptist Church prior to that – not the other way round as our introduction stated. Furthermore, Bob's wife is called Debbie – not Pauline. We sincerely apologise to Bob and Debbie for any confusion or embarrassment caused by our mistakes.

In *Origins* 47, some extraneous text was mistakenly inserted into Hans Degens' article entitled 'Skeletal muscle and the maximum life-span of men'. The paragraph starting near the bottom of the middle column on page 16 and extending into the third column is actually a repeat of the concluding paragraph of Marc Surtees' article on 'Development of resistance' on page 9.

Also in *Origins* 47, there are four sets of asterisks in John Peet's book review on pages 24 and 25 that should have been deleted. Furthermore, the sentence beginning "As with Tyler..." half way down the first column on page 25 should not be in italics.

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Typhoon catastrophe challenges geological timescales

David Tyler

In December 2006, a super-typhoon struck the Philippines leaving devastation in its wake. Massive mudslides triggered by the catastrophe overwhelmed farms, houses, roads and bridges. This article explores the lessons that can be learned about the processes that were responsible for the rocks beneath our feet – and about the dramatic changes in Earth's climate during biblical history.

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My creation testimony

Ruth Paterson

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***Tiktaalik,* the 'fishopod' from the Canadian Arctic**

Paul Garner

Newspaper headlines in 2006 announced the discovery of a new 'missing link' between fish and tetrapods. Named *Tiktaalik,* meaning 'large freshwater fish', this fossil displays a strange mosaic of characteristics which it shares with other lobe-finned fish and some aquatic tetrapods. Paul Garner asks how we should interpret such an animal from a creationist perspective.

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Book Reviews

Typhoon catastrophe

challenges geological timescales

David Tyler

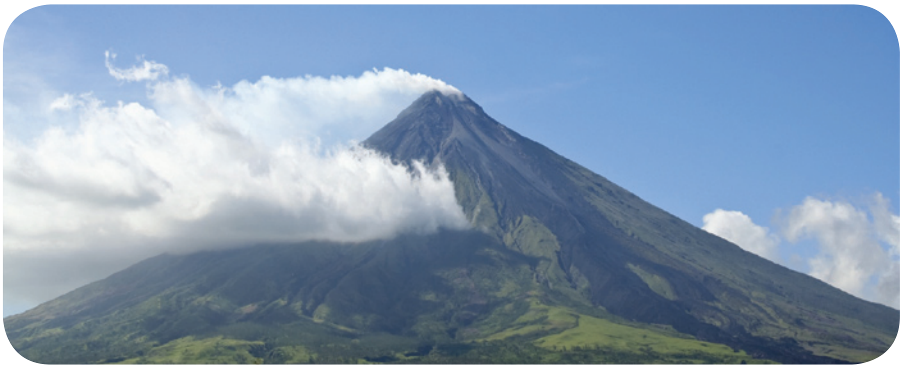

Figure 1. Mayon Volcano – the perfect cone. © 2008 Simon Gurney, www.istockphoto.com.

A super-typhoon struck the Philippines in December 2006 and triggered massive mudslides from the slopes of a volcano. Within minutes, debris flows devastated human settlements and eroded the flanks of some river channels to a depth of about six metres. These events provide evidence from contemporary natural processes that can challenge claims that the rocks beneath our feet have been laid down over thousands and millions of years.

Filipinos are used to typhoons, experiencing many of them each summer. However, Durian was a super-typhoon with great wind energies and high rainfall. The focus for the damage was an area in Albay Province around Mayon Volcano which was deluged with torrential rains. This generated massive mudflows descending from the upper slopes, sweeping along boulders as big as cars. Rural communities around the volcano were ravaged and the death toll was estimated to be at least 720 people. 200,000 homes were damaged by the typhoon and over a million people were affected.

Mayon volcano is known as 'the perfect cone' **(Figure 1)**. It is 2,462 metres high and located 15 kilometres north-west of the provincial capital of Legazpi. The volcano is active, with several alerts in 2006 because of earthquakes, ground swelling and minor discharges of ash. The lower slopes have been heavily logged, leaving the poorly consolidated soils of the volcano vulnerable to erosion by water.

The rains from Typhoon Durian started to erode these soils. The streams were soon filled with slurries and became more erosive as they flowed downslope **(Figure 2)**. Muds mixed with boulders swept down to the lower ground used for farming and housing. Everything in the paths of these flows was overwhelmed and destroyed **(Figures 3 and 4)**. Paddy fields were covered by thick layers of volcanic ash and debris. Houses were crushed and buried. Some buildings on the margins of the flows are still standing but have to be dug out to bring them back into use. Power lines and communication systems were put out of action **(Figure 5)**.

River channels were transformed into raging torrents, carrying giant boulders apparently effortlessly. These flows were extremely destructive, collapsing bridges, widening channels and undermining foundations **(Figures 6 and 7)**.

My visit to the area was about six weeks after these events. Wherever there were mud flows, there was catastrophe. However, nearby, people were still trying to carry on as usual. Some reclamation work had commenced, but it will take years before the devastation wreaked in those few hours can be repaired.

Whilst the effects of such climate instability on humans are life changing, there are lessons to be learned by considering longer timescales. We are familiar with river flood plains in our own country: these are often very extensive flat areas around river channels. They have a sediment cover resulting from numerous flooding events in the past. People today seem to think that the danger of flooding is past and they have built houses on these flood plains. However, it should not be regarded as something particularly special or unusual when they are flooded again.

Around much of the UK coastline, erosion is significant with rates of the order of 1-2 centimetres per year **(Figure 8)**. The relentless action of the sea is such that coastal defences give only a temporary respite. Those who think governments should spend massive amounts of money to preserve buildings near to the edges of cliffs are being unrealistic. It is like King Canute who, according to legend, tried to resist the advance of the tide. Sea defences are often built in order to safeguard harbours. To hold back the power of winter

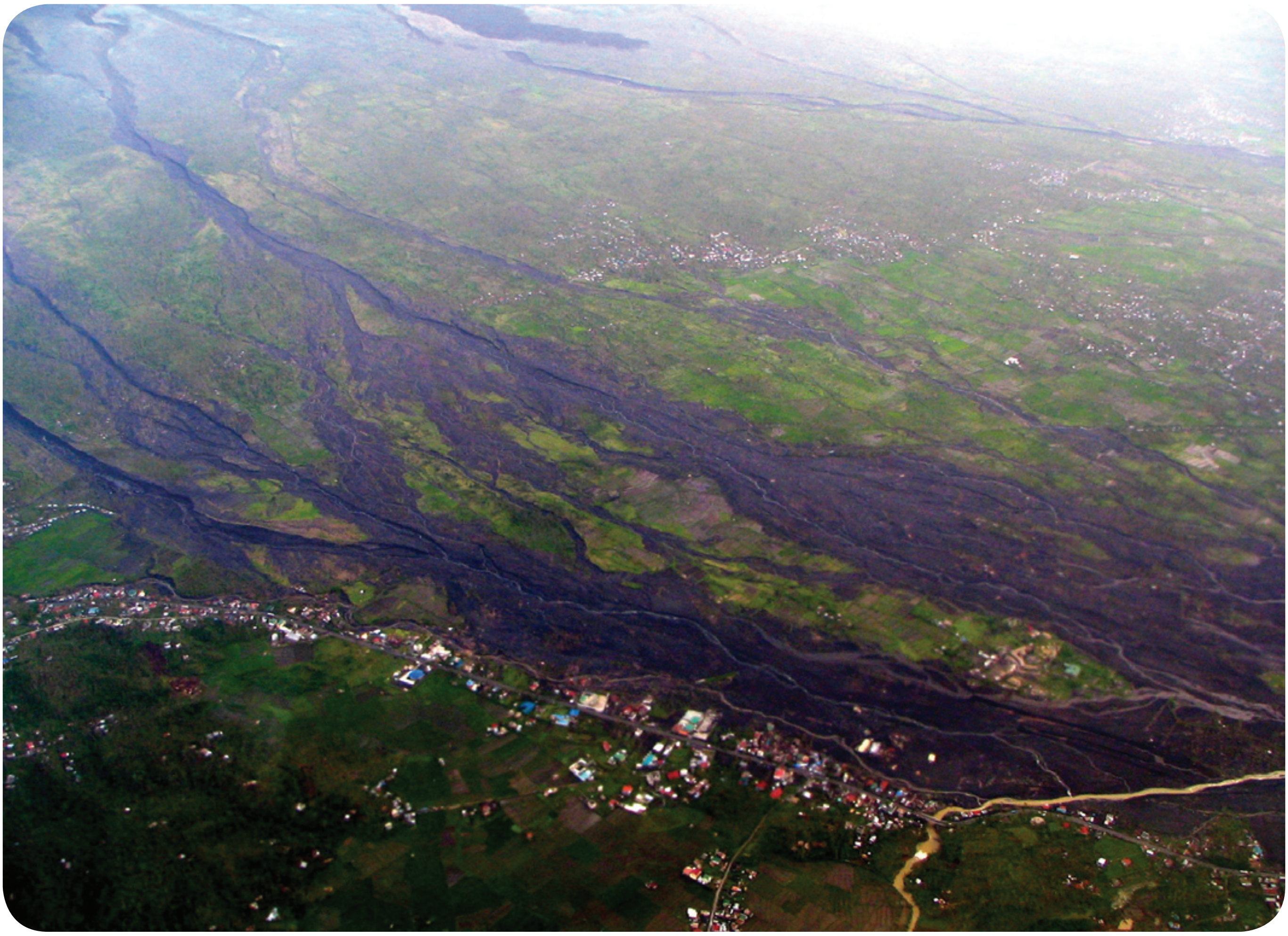

Figure 2. Mud flows as seen from the air. © 2008 David Tyler.

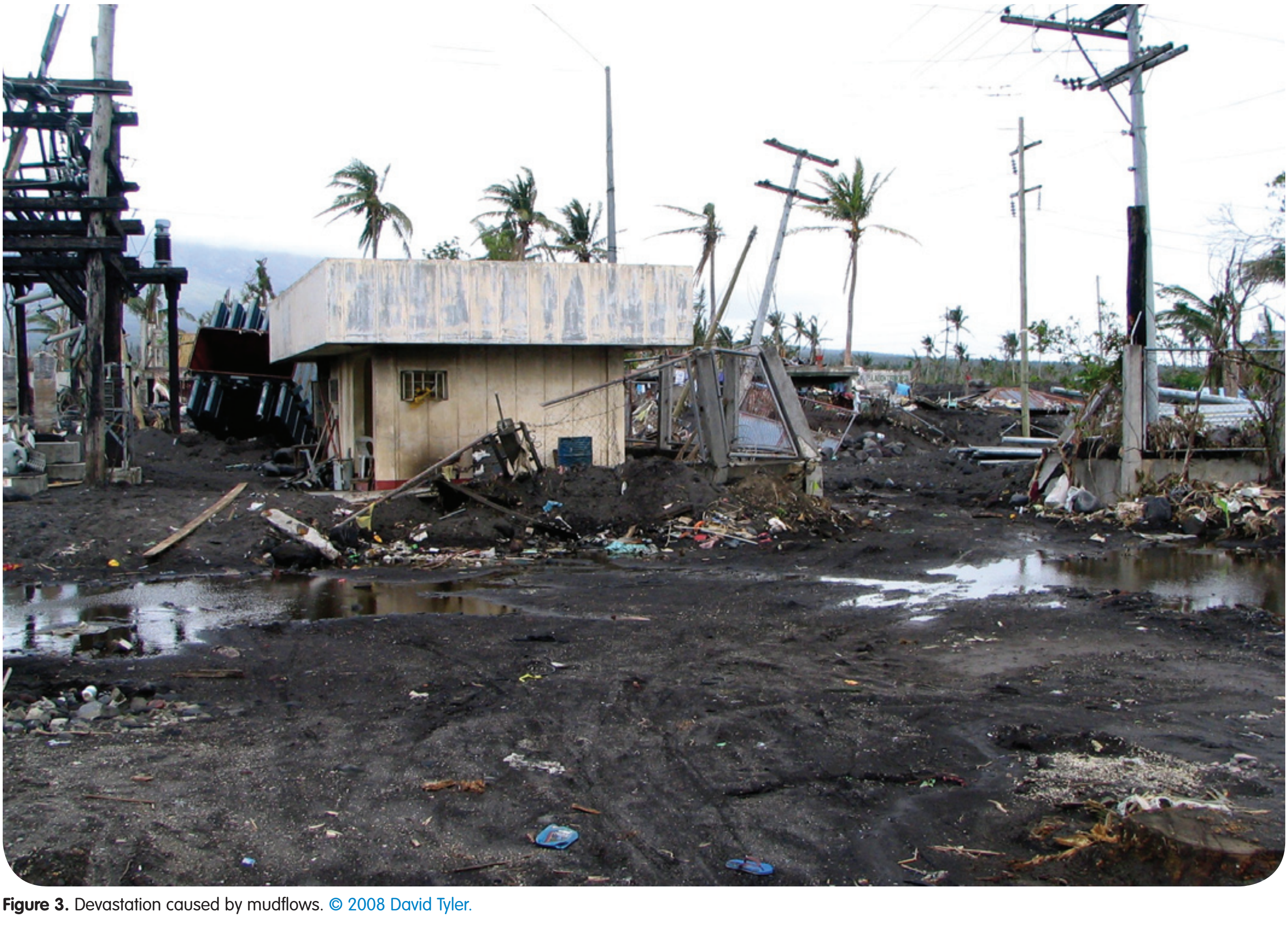

Figure 3. Devastation caused by mudflows. © 2008 David Tyler.

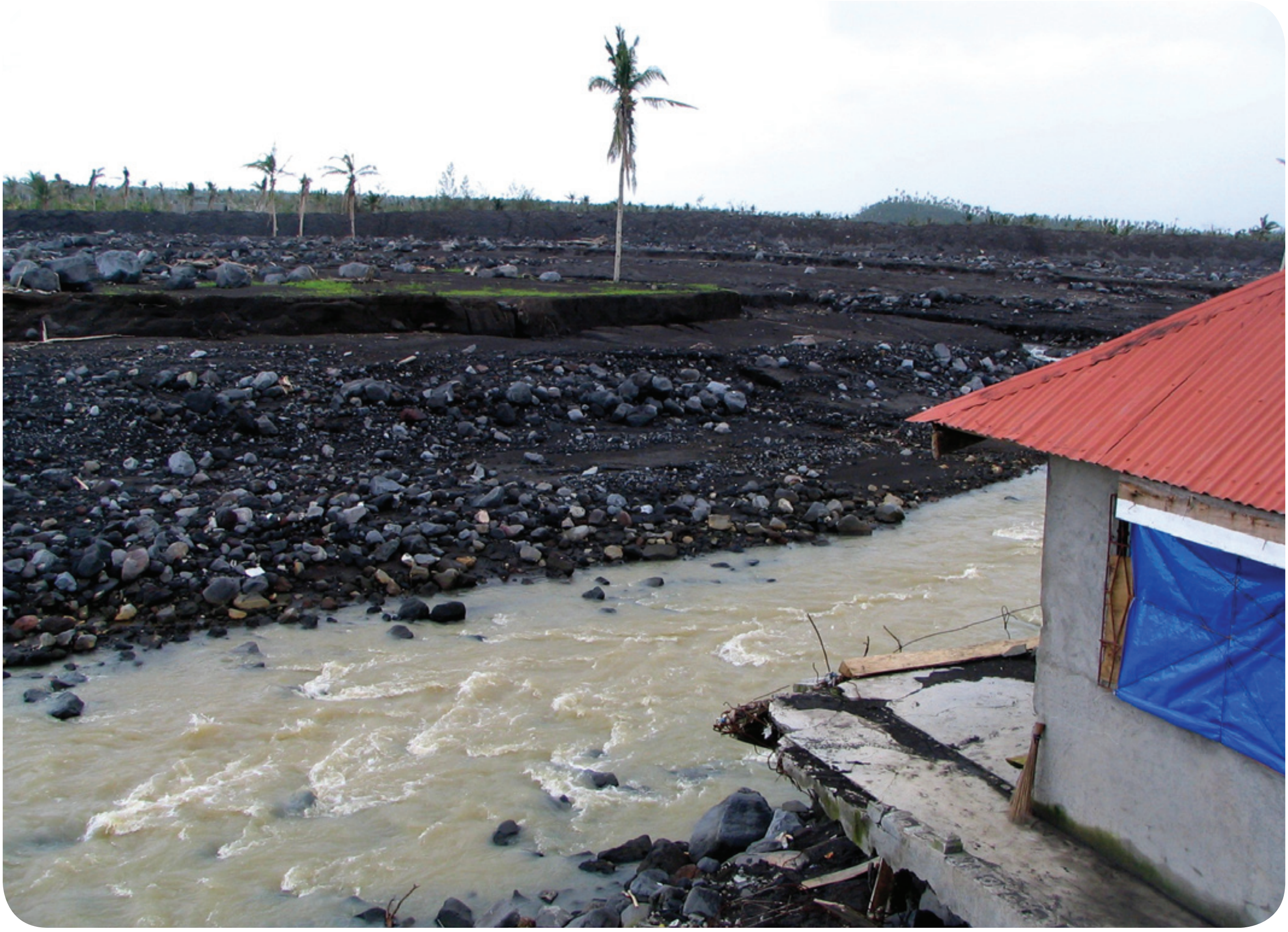

Figure 4. Undermined foundations of a house close to a mudflow channel. © 2008 David Tyler.

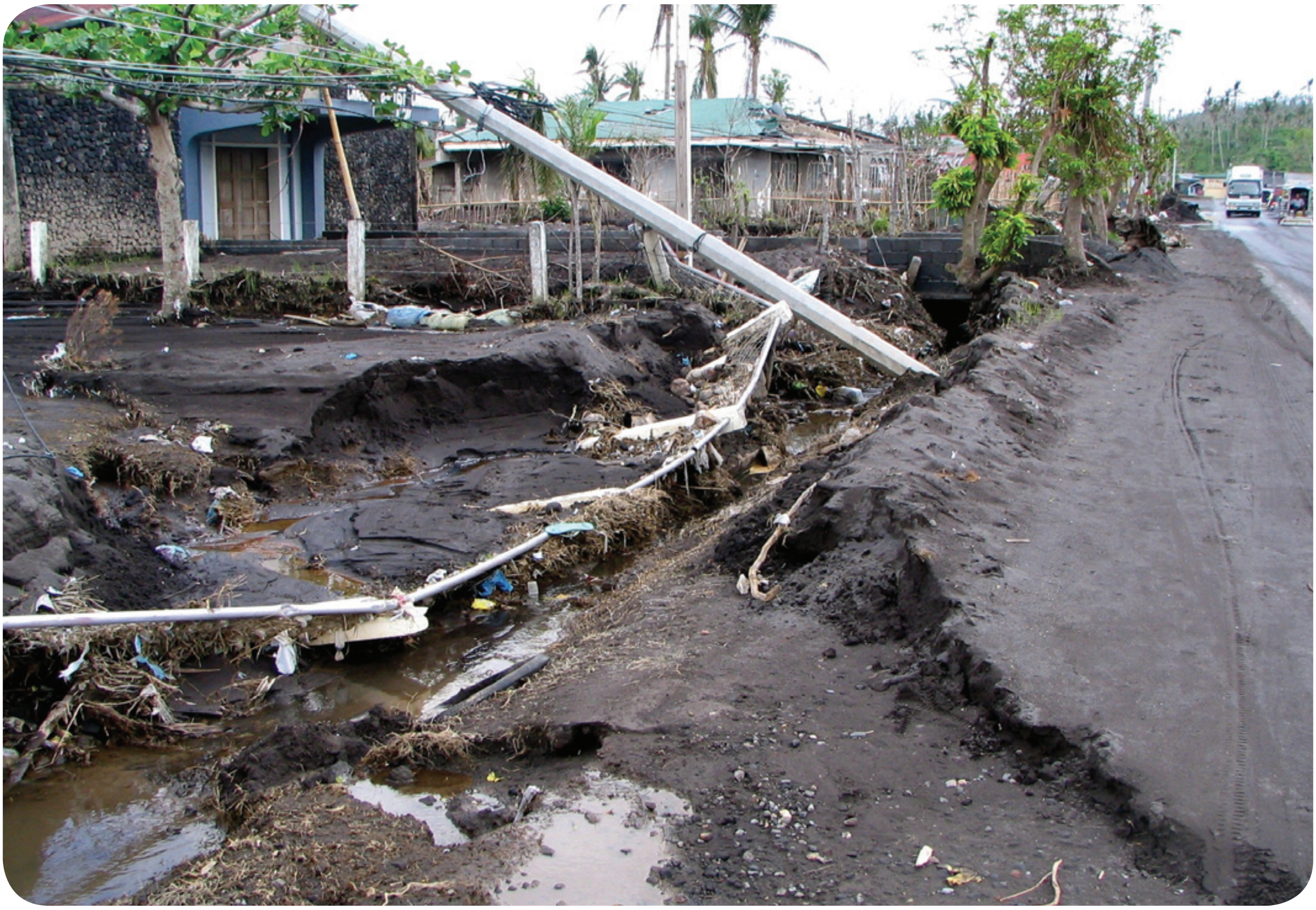

Figure 5. Power lines brought down by the typhoon. © 2008 David Tyler.

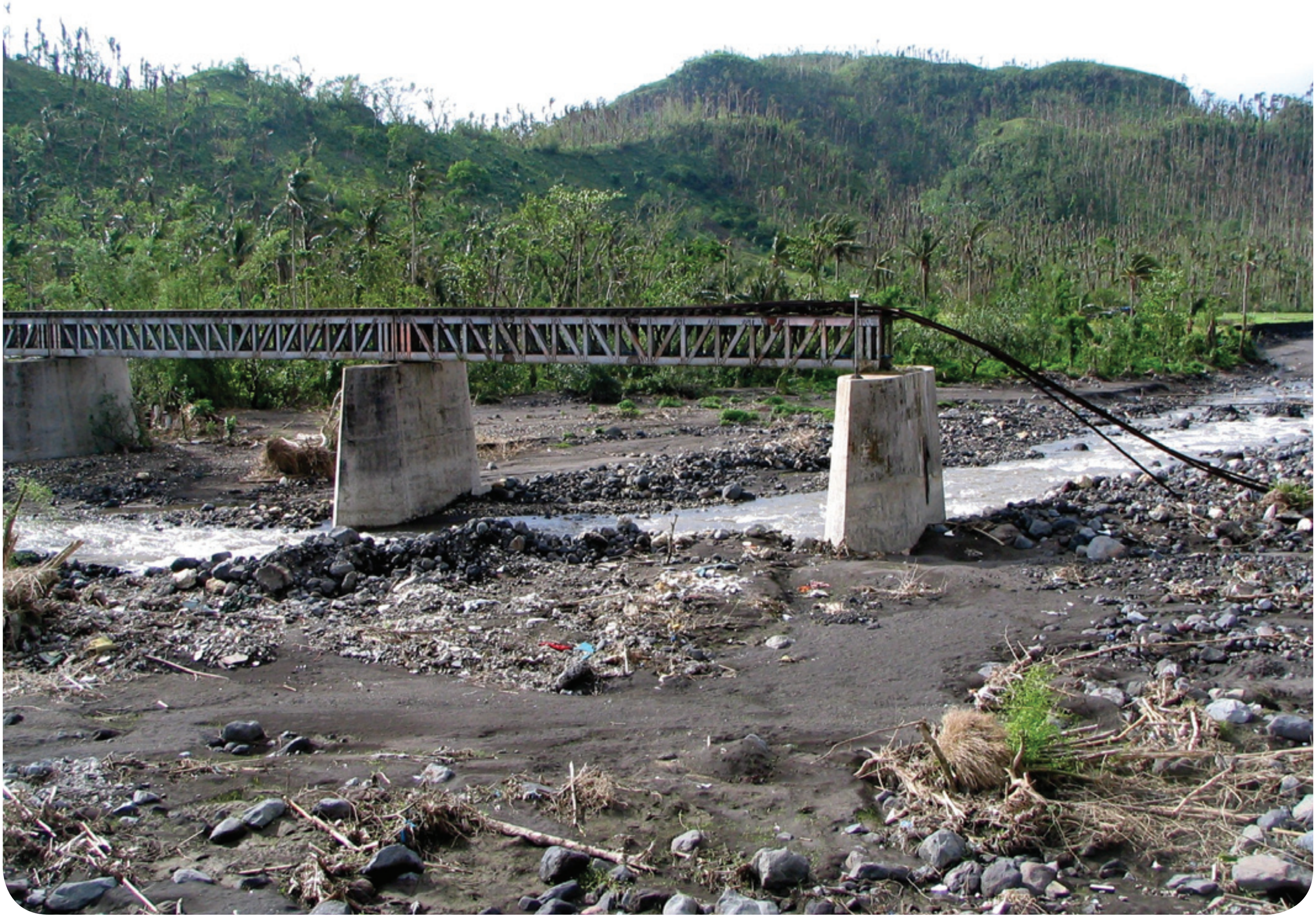

Figure 6. A railway bridge swept away, with the river bed strewn with boulders. © 2008 David Tyler.

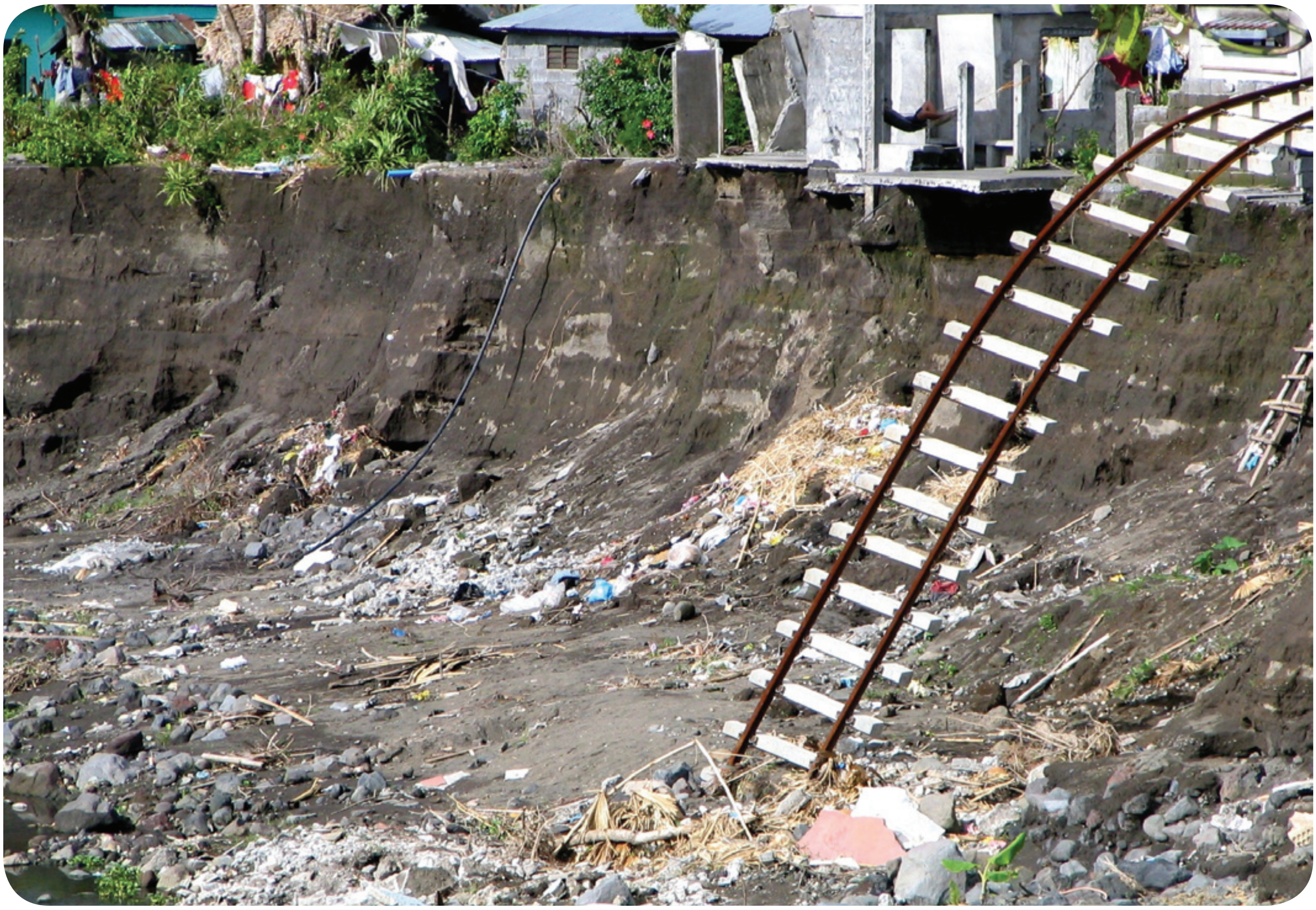

Figure 7. Undermining of a railway line and the river bank. © 2008 David Tyler.

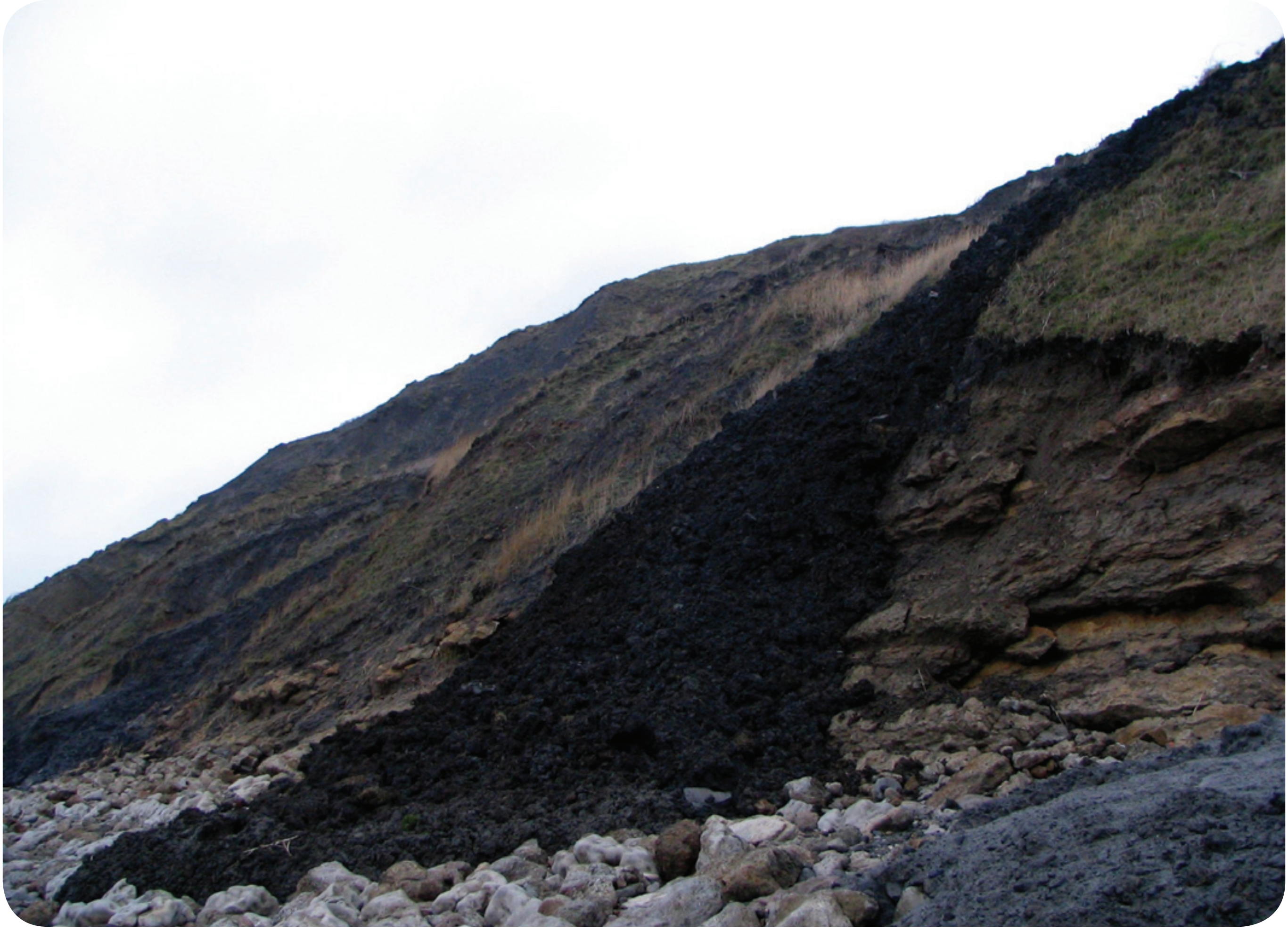

Figure 8. Coastal erosion in the UK: landslides near Osmington Mills, Dorset. © 2008 David Tyler.

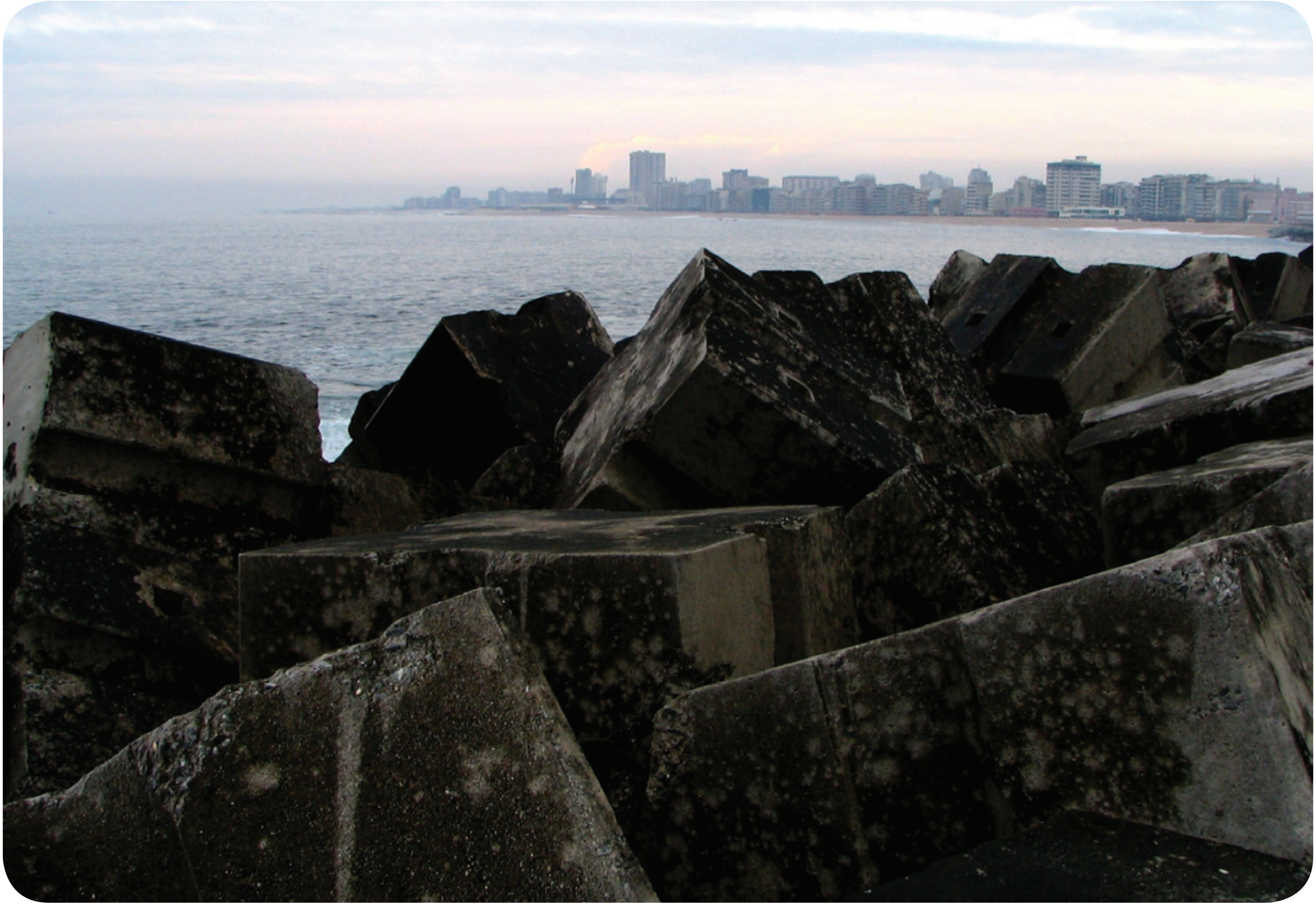

Figure 9. Concrete blocks (weighing over 50 tons) protecting Porto harbour from the power of the sea. © 2008 David Tyler.

storms, massive blocks need to be secured in place **(Figure 9)**.

Floodplains, receding cliffs and sea defences are witness, not to climate change, but to exceptional weather behaviour in our contemporary climate system. Yet, somehow, the human psyche goes into denial, unwilling to acknowledge that we have always had to bow before the force of the storm.

There are historical evidences of climate change affecting human activities. The 'Little Ice Age' is associated with remarkable illustrations of the River Thames freezing over during the winter, with ice thick enough to support temporary buildings and crowds of people. Many places in Europe record the same cold period. For example, the terminal moraines of glaciers in Iceland and in the Alps record the positions of these past advances, often hundreds of metres beyond those typical of the twentieth century. Some centuries earlier, during the 'Medieval Warm Period', northern England had the climate to host one of the centres of European civilisation. From the tenth century to the thirteenth, the Vikings settled (and successfully farmed) a northerly island they called 'Greenland'. Today, it is a barren, snowbound wilderness.

By looking at sedimentary rocks, we can gain information about environments and climates in the more distant past. In particular, we can ask questions about whether those climates were significantly different from those of today. There was a long period in geological science when it was not easy to reason like this, because the present, it was declared, is the key to the past. Lawyer-turned-geologist Charles Lyell published his *Principles of Geology* in 1831-33 and was extraordinarily influential. These principles have dominated geology for 150 years. To be 'scientific', geologists had to refer all observations to 'norms' defined by present-day processes. The present, claimed Lyell, is the key to understanding the past.

One of the first lessons experienced by many young people studying physical geography/geology concerns the 'rock cycle'. They learn about modern-day erosion and sedimentation and recognise that it takes thousands of years for these modern-day processes to do any appreciable geological work. This 'mental model' of how things happen is actually a disservice to students, because we do have contemporary evidence, such as that from Typhoon Durian, contradicting the idea that geological processes are uniform through time. Textbook photographs of scenery apparently unchanged after 100 years show that many present-day processes are indeed slow, but they should not be extrapolated to declare that these same processes were responsible for bringing the scenery into its present form.

> “
> After the Flood, there continued to be climate-changing volcanism and mountain-building.

Happily, geology has moved on, although Lyell's legacy is still far from being eclipsed. Geologists are much more aware of catastrophic processes making significant contributions to the rock record. The climatic instabilities associated today with global warming have provided opportunities for students to examine a variety of scenarios involving more intense erosion and sedimentation. However, we need to ask the question: are these the rare extremes within a weather spectrum we describe as 'normal', or are they witnesses to environments and climates that are significantly different from our own?

To give an example, in one of the past geological periods known as the Cretaceous, sea temperatures are now regarded as being warm (20-25 °C compared to today's average of 15 °C), with elevated carbon dioxide and oxygen levels. Research has been undertaken on the inevitably vigorous weather system and its corresponding sedimentary products. With high carbon dioxide, warmer oceanic waters, and different sea water chemistry, the Cretaceous Period was ideal for the rapid production of chalk by coccolithophores, the single-celled marine algae that secreted tiny chalk particles **(Figure 10)**. Today, these algae do not produce significant quantities of chalk, and the best we get is ooze on the sea floor with a proportion of chalk. Thick units of pure chalk would never form in present-day environments and climates. However, when we substitute the Cretaceous environment for our own, chalk formation makes sense (and millions of years are not needed). It is also an indication of design: there are many (often hidden) mechanisms for stabilising the Earth's climate and environments. In the case of chalk, the marine organisms acted as a soak for excess carbon dioxide.

Those who accept the reality of a global flood, as described in Genesis 6-8, recognise that the Earth has experienced climatic upheavals orders of magnitude greater than we have today. After the Flood, there continued to be climate-changing volcanism and mountain-building. When Noah surveyed the post-Flood world, he may well have seen violent winds and torrential rains. The thought that another Flood was imminent must have crossed his mind. So God's promise in Genesis 8:21-22 was of great significance. Local floods and natural disasters would be features of the post-Flood world, but never again would the world be inundated by water. In the grace of God, natural mechanisms exist to bring relative stability to the Earth's climate, restoring the world so that it is a home to mankind and all the creatures God has created.

Humans appear to have a psychological (and spiritual) hunger for stability and peace. We try to create our own places of refuge. But what if the world is not tranquil? What if upheaval and turmoil should be recognised as being more prominent than we would like to admit? There is a growing appreciation that scientific thinking has not been independent of cultural norms. It is suggested that Lyell's 'principles of geology' were like this: an elaborate attempt to tame the forces of nature by making the norms of the present 'the key to the past'. The practical effect of this thinking in the nineteenth century was to effectively banish the rare event (invariably catastrophism in one form or another) from further consideration. Climatic instability helps us rethink what 'the present' actually means and to realise that, sometimes, the geological work that we once thought would take a century can actually be done in an afternoon. ■

On the theology of natural catastrophes

This perspective does not lead to complacency about the environment nor indifference to global warming. On the contrary, it does not diminish at all our responsibility before God to care for the Earth. Our dominion over the Earth (Genesis 1:28) is an aspect of image-bearing, for Christ has dominion over all things (Psalm 8; Hebrews 2:6-9). However, the Creation today is not as it came from the hand of God. The entrance of sin into the world brought big changes. The judgments of God because of the entrance of sin in Eden (Genesis 3:14-19) brought many changes in addition to human death. The post-Fall situation is described in Paul's letter to the Romans (8:19-22). The whole creation is groaning as in the pains of childbirth because of him through whom sin came. The so-called natural catastrophes reveal the anger of God against sin. Jesus' words about those who were crushed when the Tower of Siloam fell on them are applicable to any disaster involving the loss of life. Luke 13:4-5 – "Do you think they were more sinful than other people living in Jerusalem? But unless you repent, you will all likewise perish." In each case, we are brought face to face with the Living God whose response to sin is to be a consuming fire. This message does not inhibit us participating in relief efforts for those caught up in the tragedy. On the contrary, such occasions are opportunities for showing compassion and sharing the grace we have received through Christ. Every such event therefore has spiritual significance.

Global warming appears to be linked inextricably to climate instability. Although average global temperatures have risen by only 0.6 °C over the past 100 years, we appear to be witnessing greater numbers of hurricanes, tornados and typhoons in various parts of the world. Is the reported trend of global warming a consequence of human activity in consuming fossil fuels? Has global warming plateaued and are we now cooling again? This article is not written to answer these particular questions, although it is fair to say that Christians are to be found on both sides of the argument. Whatever our response, we are nevertheless still accountable to God for the way we consume energy and for our lifestyles. ■

Figure 10. Chalk cliffs – a witness to a different climate in the Earth's past. © 2008 David Jakes, www.istockphoto.com.

My creation testimony

Ruth Paterson

I was brought up in a Christian home where the Bible was believed absolutely and became a Christian at about eight years old. Everyone I knew believed in biblical creation. Loving mountains and travelling, I went to university to study geography. In my first year, one of the courses was on Social Geography – anthropology. One of the very first essays I had to write was on the origins of man. I wrote the essay, but added at the end that I personally believed that God had created man and that man had not evolved from the apes. It was rather a shock to be summoned to the Professor's office! He was mildly amused and rather condescending about my "out-dated religious beliefs", but no further problems arose.

It was not long before the ages of the rocks, plate tectonics and continental drift started to worry me. How could these great ages of rocks fit in with the biblical account? Could the days of creation represent great periods of time? I took a post-graduate education diploma and for 15 years taught A-level geography and also pre-degree geography to adults, in a college. On field trips to Dorset, I would point out various rock layers and date them at 300 million years old etc. I loved teaching and interacting with students and felt I had the perfect job! Deep down however, there was an unease and so many unanswered questions. I told the students that I believed in God but couldn't really explain the relationship with Genesis and the great ages of the rocks. In all this time, despite being a regular church-goer, youth leader, and reading quite widely and attending Christian conferences, I never came across any literature which helped me. I had attended a Creation meeting at church, hoping to hear a clear explanation of the questions I had, but I was disappointed and upset by the speaker ridiculing scientists and making fun of their arrogant ways. This discouraged any further investigation of Creation Science literature for quite some time.

> “I told the students that I believed in God but couldn't really explain the relationship with Genesis and the great ages of the rocks.

It was in 1994 when I was expecting my second baby, that I was forced to rest due to a difficult pregnancy. I had lots of time to read and decided that rather than fret at being so inactive, I would use the time to read the Bible through in a few weeks. I then decided to read a book called *The Genesis Flood* by John Whitcomb and Henry Morris, which I had been recommended, but had not had time previously to read. I devoured the whole 500 pages and was so excited! Here was the evidence I needed. It was as if a great light was shining into my confusion! If only I had seen this book 15 years earlier! The courteous way in which Henry Morris addressed the opposing arguments was such a relief. Here were Christian scientists who were meticulous in their investigations, but who were not resorting to ridicule. I felt that I wanted to write to each student that I had taught and tell them that there was evidence for a young earth. I was so grateful that the Lord had given me the answer, and could see why the difficult pregnancy was one of those things which work together for our good (Romans 8:28). It is so good that excellent Creation material, in the form of magazines, books and DVDs are now so much more widely available. ■

Tiktaalik, the 'fishopod' from the Canadian Arctic

Paul Garner

Tiktaalik roseae. © Arthur Weasley, http://en.wikipedia.org/wiki/Tiktaalik

One of the major predictions of neodarwinian theory concerns the existence of 'transitional forms'. These are organisms that must have developed, according to evolution, as one major group evolved into another. Transitional forms would stand morphologically (i.e. in body form) between the ancestral and descendant groups. They would also be expected to lie between their ancestors and descendants in the vertical sequence of rock layers. Since every group of organisms is thought to have evolved from an earlier group, transitional forms between groups ought to be common. However, convincing examples of such transitional forms are rare; there are far fewer than evolutionary theory would predict. This seems especially true of the most easily preserved groups in the fossil record – shallow marine invertebrates such as molluscs and brachiopods. From an evolutionary perspective this is counterintuitive because these are precisely the groups that would be expected to yield the most convincing series of transitional forms.

Nevertheless, there are some fossil organisms, mostly among the vertebrates, which *are* claimed to be transitional forms. Among them are the fossils found in Upper Devonian sediments (conventionally dated to around 359-385 million years ago) which are said to document the evolution of the first tetrapods (i.e. vertebrates with four limbs) from fish-like ancestors. The Devonian tetrapods, represented by creatures such as *Acanthostega* and *Ichthyostega,* are one-metre-long aquatic animals thought to have lived a predatory lifestyle in weed-infested shallow water. Evolutionists have sought their ancestry among the lobe-finned fishes which form a major part of the fish faunas of Devonian sediments. One of these, a fish called *Elpistostege,* is thought to have been very tetrapod-like in overall body shape, although its remains are very incomplete and its anatomy is poorly known. Complete specimens of a similar lobe-fin, called *Panderichthys,* however, confirm the tetrapod-like impression. *Panderichthys* had a superficially crocodile-like skull with dorsally-placed eyes, a straight tail, and a slightly flattened body without dorsal or anal fins. Furthermore, like tetrapods, but unlike all other fishes, both *Elpistostege* and *Panderichthys* had frontal bones in the skull roof.

> “ The name *Tiktaalik* means 'large freshwater fish' in the traditional language of the Nunavut region of Arctic Canada where its remains were found.

In 2006, the evolutionary transition between fish and tetrapods again came to prominence when a new fossil lobe-fin called *Tiktaalik* was described in the journal *Nature* (Daeschler *et al* 2006). The name *Tiktaalik* means 'large freshwater fish' in the traditional language of the Nunavut region of Arctic Canada where its remains were found. Several specimens, some extremely well preserved in three dimensions and with parts of the skeleton still articulated, were discovered in a 15-cm siltstone layer in the middle part of a rock unit called the Fram Formation. Upon reconstruction, the specimens revealed a creature that was, in effect, "a better-preserved version of *Elpistostege*" (Ahlberg and Clack 2006, p. 748). Like its previously-discovered counterparts, *Tiktaalik* had a flattened body, gills, bony scales, and fins with fin rays. However, *Tiktaalik* had a longer snout, larger ribs and a wider spiracle (small gill slit), and lacked a bony gill cover. *Tiktaalik* also displayed some features of the neck and the fin skeleton that suggested that its body could be supported in shallow water or on land. In other words, *Tiktaalik* seemed to be even more tetrapod-like than *Panderichthys* or *Elpistostege.* Neil Shubin, a member of the team that discovered *Tiktaalik,* commented: "We describe this as a 'fishopod': part fish, part tetrapod" (Holmes 2006). What is more, *Tiktaalik* was found in sediments that are dated as older than those containing *Acanthostega* and *Ichthyostega,* but younger than those containing *Panderichthys;* it apparently lies between its presumed ancestors and descendants in the geological sequence. It is not hard to see why this discovery was regarded as important confirmatory evidence of the hypothesized evolutionary transition between the lobe-finned fishes and their tetrapod descendants.

How, then, should skeptics of neodarwinism evaluate the status of *Tiktaalik?* While this creature does seem to be a morphological and stratigraphic intermediate, comprising a strange mixture of fish-like features and tetrapod-like features, it should be noted that many organisms, both fossil and living, exhibit a similar mosaic distribution of character traits. A living example is the duck-billed

Did *Tiktaalik* live in a pre-Flood 'floating forest'?

According to most creationists, the majority of the fossils represent communities of organisms that were successively inundated during the global Flood of Noah's day. The Flood appears to have been a transgressive event, proceeding from the oceans onto the land. As the Flood waters advanced, communities of organisms would have been 'picked off' in the order in which they were encountered. The resulting sequence of fossils would therefore reflect the ecological distribution of organisms before the Flood, rather than evolution over long ages.

In 2003, creationist fossil expert Kurt Wise proposed that the unfamiliar plant and animal fossils of the Palaeozoic sediments (conventionally dated between 251 and 542 million years ago) may represent the remains of a huge 'floating forest' community that existed before the Flood (Wise, 2003). This would have been something like a modern 'quaking bog' but on a much larger scale, growing out over the ocean. Around the edges of the floating forest would have been small, water-dependent plants. Towards the centre of the forest, the mat of vegetation may have been thick enough to support tree-like ferns, seed ferns, club mosses and horsetails. During the Flood, the floating forest community was broken up and destroyed, with the central part being buried to form the extensive Palaeozoic coal seams.

Tiktaalik and the other strange creatures that look like intermediates between fish and land animals may have been organisms living in pools and other watery environments associated with this floating forest community – an environment that was itself intermediate between the sea and the land. The floating forest appears to have been unable to re-grow in the much stormier seas of the post-Flood world and so today its community of plants and animals is largely extinct. Our modern-day environments are ecologically impoverished when we compare them with the diversity of habitats that existed before the Flood. ■

Reference

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platypus, which has features of both mammals (hair, milk production) and reptiles (egg-laying). The late Stephen Jay Gould called such organisms "mosaic forms" or "chimeras" (Wise 1994, p. 227). When these mosaic forms occur in the right part of the geological record, they are often interpreted as evolutionary intermediates linking major groups.

However, the mosaic pattern also poses a problem for evolutionary scenarios because it often makes it difficult to identify organisms or groups of organisms that possess the 'right' combination of characters to be considered part of an evolutionary lineage. Consider the tetrapod-like lobe-fins *Panderichthys* and *Elpistostege.* Despite their appearance, these fish have some unique characters (such as the design of the vertebrae) that rule them out as tetrapod ancestors. At best, evolutionists can only claim that they are a model of the kind of fish that must have served as that ancestor. The same problem is encountered with the Devonian tetrapods. For example, *Ichthyostega* is described as "a very strange animal, and parts of it are like no other known tetrapod or fish" (Clack 2002, p. 115). Similarly, the shoulder girdles of the Devonian tetrapods "are not obviously halfway in structure between those of fishes and those of later tetrapods but have some unique and some unexpected features" (Clack 2002, p. 42). Another example is *Livoniana,* a so-called 'near tetrapod' known from two lower jaw fragments. It possesses a curious mixture of fish-like and tetrapod-like characteristics, but it also has up to five rows of teeth, a feature not seen either in the fishes from which it is thought to be descended nor the tetrapods into which it is said to be evolving (Ahlberg *et al* 2000). A similar observation can be made with *Tiktaalik,* which has an unossified backbone with an unusually large number of vertebrae – more than in its presumed ancestors or descendants (Daeschler *et al* 2006, p. 761).

> "From a design perspective, *Tiktaalik* appears beautifully constructed for its life in an aquatic habitat.

It is also worth noting that one of the key morphological transitions between fish and tetrapods – the purported change from paired fins to limbs with digits – remains undocumented by fossils. One of the most striking features of *Tiktaalik* is the structural arrangement of its pectoral fin, in which the individual bony elements are so well preserved that detailed studies were able to elucidate how it might have moved during life (Shubin *et al* 2006). It appears that *Tiktaalik* had a sturdy, though highly flexible, fin with 'wrist-like' and 'elbow-like' joints that would have allowed the animal to prop itself up on a substrate. Nevertheless, *Tiktaalik* is still clearly a fish with fins and fin rays – it does not possess the fingers and toes that mark out the tetrapods. As Ahlberg and Clack (2006, p. 748) write in their commentary in *Nature:*

> "Although these small distal bones bear some resemblance to tetrapod digits in terms of their function and range of movement, they are still very much components of a fin. There remains a large morphological gap between them and digits as seen in, for example, *Acanthostega:* if the digits evolved from these distal bones, the process must have involved considerable developmental repatterning."

From a design perspective, *Tiktaalik* appears beautifully constructed for its life in an aquatic habitat where the water was not deep enough to support the body. Many of the 'fish-like tetrapods' and 'tetrapod-like fish' found in Devonian sediments, *Tiktaalik* included, are thought to have been ambush predators lurking among the tangled weeds and roots of shallow pools and other similar environments. They were therefore equipped with characteristics appropriate to that habitat (e.g. crocodile-like morphology with dorsally placed eyes, limbs and tails made for swimming, internal gills, lateral line systems) that gave them the ability to function both in the water and, to some extent, on land. In this context, their morphologically intermediate characters can be understood as a highly efficient design for life in the marginal aquatic ecosystems in which they lived.

Summary

- ***Tiktaalik* is a lobe-finned fish with an unusual combination of characters shared with other lobe-fins and aquatic tetrapods of the Upper Devonian. However, it also had some unique characters not found in its presumed ancestors or descendants.**
- **Although evolutionists have interpreted *Tiktaalik* as a transitional form, it was clearly a fish with paired fins and its discovery sheds little light on the origin of limbs bearing digits.**
- **From an intelligent design perspective, *Tiktaalik* appears beautifully constructed for its life in an aquatic habitat where the water was not deep enough to support the body. ■**

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Glacial megaflood responsible for canyon formation

A classic amphitheatre-headed canyon in Idaho, USA, was carved by a catastrophic glacial flood, according to a recent study. For a long time, geologists thought that the slow seep of groundwater was responsible for the formation of Box Canyon, because it is carved into a plain of basalt (volcanic rock) with no drainage network upstream. However, when Michael Lamb of the University of California, Berkeley, and his colleagues began to examine the standard theory, they found that it just didn't stack up. Their calculations suggested that the spring water flowing from the canyon's headwall was far too feeble to move the eroded rubble downstream and make room for more. The spring water was also found to be chemically incapable of eroding the rubble by dissolving it. Instead, the field evidence, including the remains of plunge pools and scoured rock surfaces, indicated that the canyon had been cut by a large flood of surface water which was powerful enough to break up the fractured basalt bedrock. Lead scientist Lamb said, "We fully expected to find Box Canyon was carved by groundwater, but then all the evidence we found pointed at a megaflood." The researchers concluded that the timescale for the canyon's formation was only 35 to 160 days. Creationist modelling in the 1990s was able to show how widespread ice sheets could have developed after the Flood, as moisture from the warm oceans fell as heavy snow on the cold continents. Box Canyon is yet another example of a feature that owes its origin to the rapid melting of the ice sheets at the end of this glacial episode. ■

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Reader's Viewpoint

Noah's Ark Zoo Farm: an update

Anthony Bush

Figure 1. Gerald the Giraffe, a new arrival at the farm in 2007. © 2008 Anthony Bush.

Noah's Ark Zoo Farm is set in stunningly beautiful North Somerset countryside, in the Green Belt five miles from Bristol. We had an encouraging year in 2007 – our ninth season – with 123,000 visitors, and following our 2006 North Somerset Top Attraction award, we were also finalists in the 2007 Top Large Attractions of the South West. Gerald the giraffe arrived into his unique and deluxe house with under-floor heating and his own weigh scales. He is awaiting his mate, Genevieve, who is in a Blue Tongue control zone in Germany. But he now has three zebras and three ostriches for company. He followed a year behind Rumbull and Rumba the White Rhinos from South Africa. In 2007 we also introduced Siamang gibbons, the largest of the lesser apes, coatis, tapirs, porcupines, alligators, and raptors among others. We have also zoned the park into continental areas.

Figure 2. Two muddy rhinos lock horns.
© 2008 Anthony Bush.

Noah's Ark Zoo Farm (NAZF) is unusual in many ways. It is the only working farm which incorporates a large animal zoo. It has enormous adventure play areas, including two record-breaking mazes – the longest hedge-maze and the longest indoor 3D maze in the world. There is a strong emphasis on families having fun together; so adults can go on most of the play apparatus with the children. There is a further emphasis on handling and feeding animals; so young and old can hold and examine a number of animals and feed or stroke many more. It is also run by Christians, and we want to show people the marvels of creation, and help them to believe and follow Jesus Christ.

Related animals?

Our theme of Noah's Ark is very versatile. We keep a wide variety of animals and show their astonishing variety and detail. As we are a farm too, having grown most British food crops in the last 46 years, we want to put people back in touch with where their food comes from. We take people on a tractor ride to look at the crops and also the native species of wildlife that we are encouraging here. And because we want children to have lots of fun while they learn, we theme the play areas to Noah's Ark. We are also carrying out important research work. Part of this is on native species, and part is to revisit the classification of animals, to try and discover what the limits of relatedness are. Which animals did God create originally and how many animals did Noah have to rescue? Evolutionists who don't think God is necessary, and creationists who do, are agreed that lots of animals are related to each other, but differ about the boundaries of relatedness. There is definitely lots of variation and lots of survival-of-the-fittest!

Micro-evolution

Our Shire horses, miniature Shetlands, zebras and donkeys all belong to the same family and appear to be able to hybridise with each other. Our White Rhinos are related to four other species of rhinos alive today that all seem related to the woolly rhino of the fossil record. Some species have front incisor teeth; White and Black Rhinos have no incisors at all. Some are fairly hairy; they have different numbers of nose horns. So, too, our Brazilian tapir is very similar to the Malayan, Baird and Mountain tapirs, and all are endangered, like the rhinos.

Classified orders – designed to evolve?

The classification system would put horses, tapirs and rhinos, in the same order

Figure 3. The Noah's Ark Zoo Farm buildings from a nearby hill. © 2008 Anthony Bush.

(the biological category between class – mammals in this case – and family), and for good reason. They have a similar body structure, and similar digestive system with a single stomach and a caecum or back-end stomach. But are they related through a random evolutionary past, or are they separate designs by the same designer? It has been said that Darwinism is a theory that has been proposed and developed but never tested. If we test the relatedness of these three (odd-toed ungulate) creatures we would need to look at their present appearance and then at the fossil record for their first occurrence to see if a relationship seems likely.

Testing Darwinism

From their present appearance they are markedly different:

- **The tapir has four toes on the front and three on the rear and a flexible short trunk; it is of medium size with short legs and is a heavily-built browser.**
- **Rhinos are very large animals (the second biggest land mammal) with unique nose horns (made entirely of hair – keratin) and unique face shape and composite three-toed foot – like the ace of clubs – and have very thick skin.**
- **Horses and donkeys have been tamed from ancient times, so have been bred in vast numbers for work and warfare. Two million, including mules, died in the First World War. Their sizes are very variable but their shape is most recognisable.**

From the fossil point of view rhinos and horses, like all mammals, appear suddenly without a possible related forbear, and both first occur in the Eocene rock layers; tapirs at almost the same point, in the Oligocene rock layers. All are recognisably as they are now, though the early horses had three toes and teeth that had lower crowns. Some early rhinos (e.g. *Indricotherium*) were enormously bigger than now (twenty feet to the shoulder)!

So by both tests, of current appearance and of first appearance in the fossil record, these do not appear to be related families. But they do appear to have been designed to diversify into several species.

Convenient common features

It is, however a wonderful convenience that all animals have a basic design that is similar; with two ears, two eyes, a mouth and a digestive system; two legs and wings, or four legs, for locomotion; and a male/female reproductive system, similar DNA and many genes in common. This means many food chains, of creature eating creature, are possible. It also means that vets and animal keepers know roughly where to look for things (like the jugular vein), and can feed many animals on similar food, and many drugs can treat lots of animals. For example we can vaccinate lambs and emus with Lamivac! Compared with the current non-standard engineering systems that we humans have devised, the materials and layouts are a dream of consistent predictability, yet wonderful diversity!

Flawed modern classification

There are parts of modern classification which we actually think are flawed. For example there are two (or more) families of carnivores that have been classified in different families by virtue of very small differences of muscles, claws and teeth. The viverridae family contains meerkats and mongooses and the very similar mustelidae family contains ferrets, stoats and weasels. We keep some of each family at Noah's Ark Zoo Farm. Other mammal families, too, are very little different from each other, for example the families of micro-bats.

However there are huge differences, within the classified order of primates, between the apes, like our Siamangs, and man. These two are both put in the hominid family, when arguably they should be in different orders, but certainly sub-orders.

Humans and apes

There are similarities of limbs, face lay-out, teeth and digestive system. But there are much the same similarities between animals in different orders of insectivores, rodents and marsupials, in shrews, mice and phascogales (pouched mice from Australia).

For some years we have been told there is a 2% difference in the genome between apes and man. But the latest research shows far more difference: up to 6.4% in numbers of genes and 17.4% in cortex connections (Cohen 2007).

Here are some major anatomy differences:

- **Apes have fewer than 30 facial muscles whereas humans have over 50, including 24 human facial muscles that apes do not have – so that we can recognise many different face shapes and make thousands of facial expressions.**
- **The human spine joins the head from below, but the apes' from the back; humans have an S-shaped spine but apes have a C-shaped one; apes have a protruding jaw, while humans have flat faces to see where they are going.**
- **Human thigh bones taper inwards so that we can walk along a line but apes, at best, waddle when walking, and are happier holding branches or walking on all fours.**
- **Apes essentially have four hands; humans have two feet and two hands. The human foot is enormously different from a hand, having three arches of bones and a hugely strong big toe, alongside the other toes, which are all smaller than fingers. Human ability to stand, walk, balance, run and jump is in a different league to apes.**
- **Humans have continuously growing head-hair and finger- and toe-nails; apes do not.**

The sexual area is sometimes ignored for reasons of modesty, but holds some of the greatest differences of all:

- **The ape penis is kept erect by a bone in it (the baculum, like many other mammals), whereas human males have an enormously bigger (twice as big) erect penis than apes and it is filled only with blood.**
- **The human female vulva is at an angle of 45° different to apes, for frontal mating and has a complex clitoris woven round the vagina that carries twice the nerve endings of the male, for a sexual climax (like no observed female animal). There is a hymen on human females, like some other animals, but not the apes.**
- **Human body hair is mainly missing and not for warmth; pubic hairs are un-ape-like.**
- **For apes (like many other animals) sex is functional, very seasonal, very short (over in 5-7 seconds) and is solely for reproduction; these limitations are not so for humans. In humans, there is added fat on the breasts and buttocks for beauty, neither of which are possessed by apes.**

There are many other differences between apes and man that we put on displays and on our website, www.noahsarkzoofarm.co.uk. Most of them also appear in an excellent book by my friend and farm consultant Professor Stuart Burgess (2004).

Origins: which model to go for?

Christians have three major models of origins to choose from, all of which require faith to believe. We mention all of them at Noah's Ark Zoo Farm. We support one especially, but are aware that 'proof' is elusive, especially in our post-modern times.

1. **Darwinism with God added.** This model proposes that God produced the Big Bang 14 billion years ago and supervised the galaxies forming and finally our solar system and the Earth, about 4.6 billion years ago. Then God superintended the first life and after a pause of 2.6 billion years while only bacteria lived, helped it develop over the next billion years or so to become the ten million species in five kingdoms and 20 phyla of life on Earth today. The science behind this model is well known as it has monopoly air-time on television and support by celebrity atheists, who insist that God is not required for it to be true. This is probably held by most Christians, in the West anyway, but they would see it as totally impossible without God in all of it. Clearly God can do anything at any speed, so why not slowly? Adherents would want to read Genesis 1-11 as an inspired story, full of teaching, but without historical accuracy. It would be likened to the story of the Prodigal Son. I respect those who believe this, but have problems with it from the biblical teaching and geological/fossil viewpoint.

2. **Creation in about 4,000 BC.** This model affirms Genesis as history and supports a six-day Creation, followed about 1,700 years later with the worldwide flood of Noah's day. During this Flood, which is said to have lasted at least 150 days, the whole of the fossil record, from Cambrian to Cenozoic, was formed on the pre-Flood Precambrian continents; although some supporters of this view think the Cenozoic formed after the Flood. Small sea creatures are at the bottom of the fossil record and large reptiles, mammals, birds and some humans at the top, so the latter would have climbed the hills to escape the gradually-rising floodwaters, with their inevitable drowning when they ran out of hill to climb. Other proponents of this model emphasise ecological zonation as an explanation for the fossil successions, more than differential escape from the rising floodwaters. This model proposes that the pre-Flood continents suffered catastrophic break-up and rearrangement during the Flood, and were eroded down to bedrock by the waters. The Flood deposited most of the world's sediments and vegetation, including floating forests, as rock layers, coal and fossils, as well as much volcanic material being added. I admire the faithful intentions of those who take this view, who would want to believe every word of Genesis. But I think they have overlooked several very important biblical and geological matters (see below).

3. **Recolonisation Model** – in a nutshell: see www.earthhistory.org.uk for more! This model has been proposed by a number of former, unsatisfied believers in (1) or (2) above. They also believe every word in Genesis and support a six-day Creation, followed about 1,700 years later by the worldwide Flood of Noah. However, this model sees in the Genesis text a very sudden wipe-out of all land animals and people in the first few days of the Flood (not 150 days as in (2) above). But where in the fossil or historic record is such a Flood? The only place where most geologists are coming to the conclusion that the Earth was covered in water is the Archaean (early Precambrian) (see 'Water, water everywhere' on www.earthhistory.org.uk). If we ignore for the moment the radioisotope dates, there is nothing else that requires this to be more than a few thousand years ago. Archaean eruptions would have been caused by the asteroid storm that also hit and resurfaced the Moon, probably in one and a half Moon rotations, in the Archaean era (and many of the planets and their moons, at a time known to astronomers, ironically, as the Noachian era). Heavy rain, together with the opening of the "fountains of the deep" of Genesis, which could have been both huge water caverns and also volcanic lava, combined to burn up and submerge the entire pre-Flood world, into what secular geologists call 'the Hadean'. This model then sees the subsequent geological activity as following in the order that secular geologists propose, but being the story of recolonisation of the world after the wipe-out; and that it would need a drastically shorter timescale, rather than one billion years. Suddenly the fossil record makes sense. The fossils do not confirm a gradual progression of Darwinism, nor do they record a jumbled chaos of a worldwide flood; but they seem to fit with a recolonising Earth after a wipe-out.

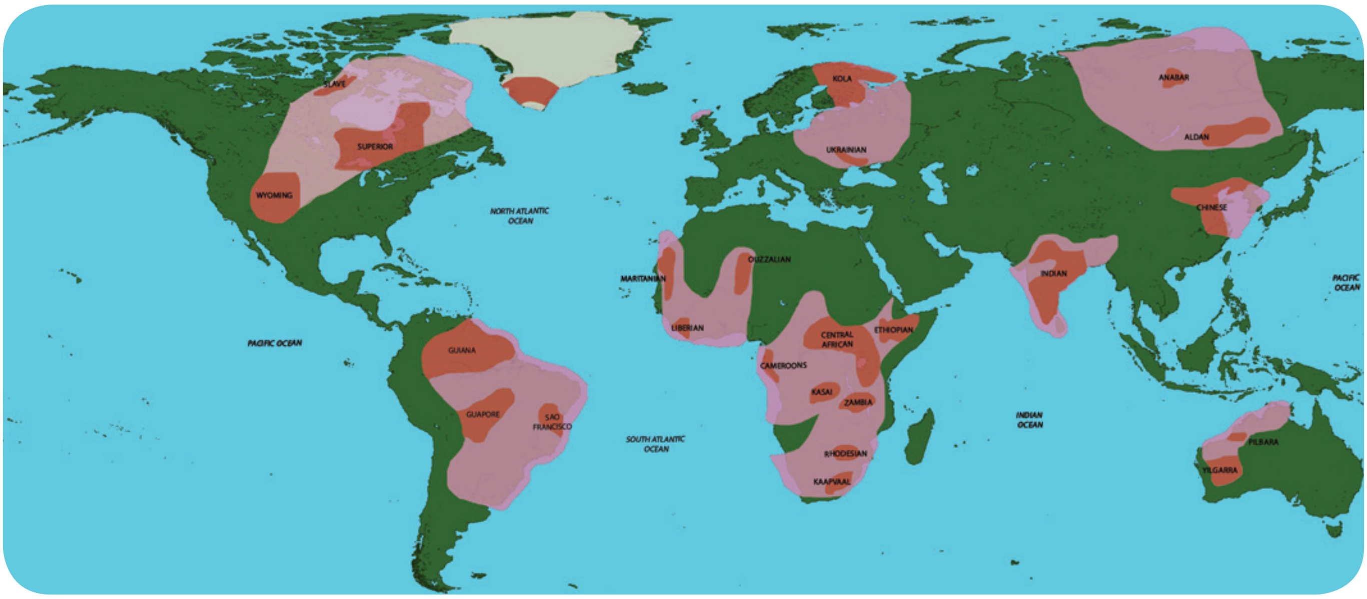

Figure 4. A map showing the global distribution of Archaean rocks on the Earth's surface today.

Ararat

So Noah would have landed on Archaean volcanic rock – a small mountain, perhaps in Africa, called Ararat (meaning Holy Land) that, like millions of acres of Archaean rock, never subsequently had sedimentary deposits on it. The small sea creatures of the 'Cambrian Explosion' containing 450 families of invertebrates, are first deposited from the Flood waters at the large new shorelines. They may well have been preserved from extremely hot volcanically-heated seawater at the cold poles. The continents grew fast by sediments being laid down quickly in a very unstable climate, while the continents moved fast on newly-forming plates. A few hundred years later, the creatures from Noah's collection of vertebrates, invertebrates and plants begin to reach the continental margins and are fossilized in the order of their success in reproduction; egg-laying amphibians, plants, fish, then lizards. Therefore the Devonian and Carboniferous explosion of insects are all from the air, not from the sea as Darwinists inaccurately state, so would have been developing on Noah's big land mass of Pangaea. The Carboniferous had to last a significant time to allow forests to grow and be submerged, and re-grow and be submerged, to form the coal layers from which that period takes its name.

Mammals, dinosaurs and birds fossilized together

Initially, mammals, dinosaurs and birds all escaped being fossilized by living on the huge Archaean deposits that form the core of the continental cratons (stable continental crust), and that have never again been submerged since the Flood. **Figure 4** shows the original Archaean land mass, in pink, which was never re-submerged but has now split into the continents we know today. These animals would have spread onto the Jurassic landmass before it split into modern continents. Could this have been the generation of Peleg, when the Earth was divided? These, and later sediments that had grown vegetation, would have been the environment of mammals, birds and dinosaurs to be fossilized by small or large local inundations of sea water in severe weather. These inundations, because the surface was new, hot and unstable, would have been like bigger versions of the hurricanes we know today and volcanic activity like Mount St Helens, on a much more frequent, larger scale. All the continents would have been inhabited by the time the splitting of Pangaea occurred in the Jurassic. So rheas and llamas developed slightly differently on South America from emus on Australia, and camels on Africa and Asia.

This model would hold no surprises for thousands of secular geologists, who believe in this chain of events. But the speed of it all is the challenge to them. On the other hand, there is, at last, a reason for the sudden appearance of reptiles, birds and mammals – not an evolutionary order, but a recovery order. If a study is made of the rocks alone, they do not need more than a few thousand years to put in place. It is the philosophy of gradual evolution that requires the millions of years that Darwinians describe, along with radioisotope dating.

Radioisotope dating

It is possible that the asteroid bombardment at the time of the Flood produced a greatly increased rate of radioactivity, which has been slowing down ever since. The speed of light may also have decayed then, even sharply, further allowing a young interpretation of older radioisotope dates. The RATE group (a team of creationist scientists investigating **R**adioisotopes and the **A**ge of **T**he **E**arth) is working on other anomalies also.

Do 4,000 BC creationists believe in a truly biblical Flood?

The Genesis Flood story states that the waters were 15 cubits deep at 40 days after the Flood began (Genesis 7:17-20), receding until, at 150 days, the Ark touched down (Genesis 8:1-4). This does not allow the 150 days that the traditional Flood model includes, to lay down the fossils, with dinosaurs, birds and mammals at the top. Our Lord Jesus describes a sudden Flood, like His return, in both Matthew 24:39 and Luke 17:27, and says the Flood victims were swept away and destroyed, which sounds like a matter of hours or a day or two at the most, not five months. On the other hand, the Recolonisation Model requires the second set of Genesis genealogies to be a summary of a much longer record, which I know some interpreters are unhappy with. So both models have a problem with a Genesis text.

As we were not there, none of us can be certain what really happened – faith is required. We know that faith pleases God, so I am sure that to believe God made it in one way or another and to endeavour to keep the unity of the Spirit among believers is most important. Details come second. I have chosen the Recolonisation Model, but am keen to keep the search for truth going on without losing fellowship with other believers. We welcome discussion, by email, letter, or face-to-face with visitors, at any time.

Meanwhile, our visitors to Noah's Ark Zoo Farm are usually unaware of the fine points of debate over these issues. We hope they have great fun as they look around, finding 'scientific permission' to believe in God. ■

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Rapid burial of Burgess Shale fossils confirmed

Some of the most important fossils in the world are found in the Phyllopod Bed of the Middle Cambrian Burgess Shale in the Canadian Rockies. The extraordinary fossilization of a wide variety of complex animals in this rock formation provides a remarkable window into an ancient sea floor community. In normal circumstances, only the hard parts of organisms are preserved in the fossil record – bones, teeth and shells. However, one of the outstanding features of the Phyllopod Bed is that soft tissues have also been preserved in extraordinary detail. Rapid burial has long been suspected as an important factor in the formation of this fossil deposit and confirmation has now come from the work of scientists based at the University of Leicester, UK, and the Royal Ontario Museum, Canada. Painstaking millimetre-by-millimetre logging of the shales revealed that they were deposited rapidly as a thick slurry which carried the animals into deep water. The researchers concluded that "the density currents responsible were probably largely akin to mud-rich slurries, helping explain the transport and entombment of the fossils." Leicester University's Sarah Gabbott said, "Not a nice way to go, perhaps, but a swift one – and one that guaranteed immortality (of a sort) for these strange creatures." Most creationists believe that these catastrophically emplaced slurries were associated with the global Flood that took place in the days of Noah. ■

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Sophisticated reproduction in a 'primitive' fish

An amazing fossil specimen from Australia has confirmed that at least some extinct placoderm fish gave birth to live young. The remarkable specimen of *Materpiscis attenboroughi,* preserved in three dimensions in the Upper Devonian Gogo Formation, contains a single embryo within the uterus connected by a fossilized umbilical cord. A crystalline mass near the umbilical cord may represent the yolk sac. A similar fish from the same formation, *Austroptyctodus gardineri,* also shows three small embryos inside it in the same position. Most modern fish species lay eggs which are fertilised by the males outside the mothers' bodies. However, some species, like sharks and rays, fertilise internally. The discoverers of the Australian fossils say that they confirm that some placoderms had "a remarkably advanced reproductive biology, comparable to that of some modern sharks and rays." Creationists will not be surprised by the discovery of such complex systems in a supposedly 'primitive' fish. ■

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The creation of man:

part 2

Continued from *Origins* 46

Geoff Thomas

> “This is the account of the heavens and the earth when they were created. When the Lord God made the earth and the heavens – and no shrub of the field had yet appeared on the earth and no plant of the field had yet sprung up, for the Lord God had not sent rain on the earth and there was no man to work the ground, but streams came up from the earth and watered the whole surface of the ground – the Lord God formed the man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being.“
>
> GENESIS 2:4-7 (NIV)

4. Man’s creation was distinctive in the procedures God adopted in forming man

“The Lord God formed the man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being” (Genesis 2:7, NIV). In Genesis 1 we have a sweeping panorama; man’s place is set in the whole of creation. In Genesis 2 we have a more detailed account of the making of both man and woman and there is a certain order: Adam, the man, was made first without Eve, the woman. There is no hint of this in Genesis 1. Here in Genesis 2 we are given details which are not present in the account of man’s creation in Genesis 1. We must now turn to the distinctive features of the formation of man.

i. **“The dust of the ground”**. Man was made from the dust of the ground, that is, from previously created material. Man was not made out of nothing but God took existing material and formed Adam from it. Man’s very constitution, therefore, is the ground on which we stand. God later said famously to man in Genesis 3, *“Dust you are…”* (Genesis 3:17). As a result, man has an affinity with the ground which is beneath his feet to till and dress it and from which he will cause the crops to grow. In this way there is no discontinuity between us and our earth-bound environment. If we were set down on Venus or on Neptune there would be impossible discontinuity between ourselves and those planets. It is not like that for man on planet Earth. Men who work on the land, who possess their own land have a clear affinity with it. They will hold a handful of soil and let it run through their fingers. I was once in Kenya at the end of the dry-season; the rain clouds gathered for hours and then finally the heavens opened and down came the prayed-for rain. The farmer with whom I was staying could not contain himself; out he walked into the pouring rain and into his garden – even though he was soaked through – to see the impact it was having on his land and crops. If there was any sort of discontinuity between man and “the dust of the ground” how incongruous would be man’s habitat and environment. We would be aliens on this planet.

Man also has an affinity with the other creatures, because we are told in Genesis 2:19 that the Lord God *“had formed out of the ground every beast of the field and every bird of the air”.* They too were made from the ground; man was made from the dust of the ground. There is this little distinction in the wording though it is hard to know what it signifies. It follows that there are going to be similarities between man and the beasts of the field. God does not make unnecessary diversity in living creatures and so we will find such interesting likenesses as this,

"The LORD God formed the man from the dust of the ground." © 2008 Jeffrey Heyden-Kaye, www.istockphoto.com.

that the heart of a sheep or of a pig is virtually identical to the human heart; and that an animal's heart valve can be transplanted to a human being and function in us – with the help of appropriate drugs – for many years. We would also expect to find that some animals, like monkeys, have certain other resemblances to man. We were designed and made by the same Creator from the same ground, so it would be unusual if it were not so.

ii. **"The breath of life"**. The other distinctive in the making of man was that God *"breathed into his nostrils the breath of life, and the man became a living being"* (Genesis 2:7). Here we are being told how different man is from the animals. There is a dimension of being truly human for which you cannot find any parallels with the animals. For man there was an intervention of the most intimate kind. God held the man he had formed to himself, and almost embraced him, virtually giving to him 'the kiss of life'. Man was not alive until that point; he was still inanimate dust of the earth until that 'divine in-breathing' occurred. He became a living creature then and only then, when the breath of God entered him. God did not work on previously breathing stuff. Livingness came when God in-breathed him. In fact he was not a man without the breath of God. God could not talk to him; man could not understand and obey and love God until first God breathed into his nostrils the breath of life. "Breathed", as Kidner emphasises, "is warmly personal, with the face-to-face intimacy of a kiss, and the significance that this was an act of giving as well as making; and self-giving at that" (Kidner 1967, p. 60).

Only after this in-breathing could Adam stand and look around and examine all the other creatures God had made from the dust of the ground. But he could not find one counterpart in all the animals of the earth. There was *"no helper suitable to man"* (Genesis 2:20). There is no hint in the text here that for some long period of time there were other creatures, similar to men, alive and manlike; that then God worked on one of these pre-hominoids in a second stage of creation and made a man out of this earlier creature. Adam was not alive and he was not a man until God did this one work of forming him from the dust of the ground and breathing into his nostrils the breath of life. Then Adam became both alive and a man. In a single unbroken divine action this occurred.

The battle over human origins

It is only by this act of divine exhalation (Genesis 2:7) that you can account for the nature of man; you cannot explain the extraordinary phenomenon of man by reference to other kinds of being like insects and reptiles and fish and birds and animals. You may find interesting congruities between each of them but nothing in them can tell us what man is without this distinctive act of divine creation.

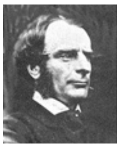
Man's origin was due to a special act of God, making men and women in his image and likeness. A process of evolution by forces and potencies resident in the lower forms of life cannot by itself account for the apostle Paul, Galileo, Shakespeare, Mozart, Rembrandt, Sir Isaac Newton or Jesus of Nazareth. Certainly there is development within a kind. We must recognise that. There were two dogs taken onto Noah's ark and today there are several hundred breeds of dogs of all shapes and sizes as they have developed or diversified in different ways. There is a potential within a created kind itself to diversify by its own power, and this is the proper theory of evolution. But once you speak of a divine act coming upon the material of creation then you are no longer speaking of evolution; you are speaking of the power of the Creator. There is this kind of evolution; there is creation, but there is not 'creation by evolution'. Man himself owes his unique knowledge and reason and freedom and aesthetic sense and relational awareness to creation and not to evolution. He owes these attributes to the fact that God made him in his image from the dust of the earth and breathed into his nostrils the breath of life. Before that he was not a living being; before that he was not a man.

What a disaster Darwin's theory of human origins has been in the last 150 years. It contradicts Genesis and the rest of the Bible, but nonetheless evolutionary thinking has many supporters in today's professing church. In April 2006 the Archbishop of Canterbury, Dr Rowan Williams – speaking at a Church of England education conference – deplored the teaching of creationism in schools. Charles Darwin was praised in his own lifetime by many church contemporaries, and when he died in 1882, he was buried with great pomp in London's Westminster Abbey. This happened even though Darwin was not a Christian and did not pretend to be. In his lifetime he described himself as "agnostic" and said, "I do not believe in the Bible as a divine revelation, and therefore not in Jesus Christ as the Son of God."

Recovering man's dignity in creation

David Feddes, the North American radio evangelist, has pointed out how one of the first clergymen to support Darwin in the nineteenth century was Charles Kingsley (Feddes 2000). Kingsley was an educationalist, a founder of the Christian Socialist movement and the author of edifying moral tales for children. "He was renowned as a social activist, author, professor, chaplain to Queen Victoria, and Canon of Westminster Abbey. Kingsley said he was in awe of Darwin's theory, even though it meant, as he put it, 'I must give up much that I have believed.' He tried to blend Darwinism with his own version of Anglicanism, a version which came to be known as 'muscular Christianity'. Kingsley taught that humans evolved from apes and later received a divine spark, which enabled us to keep making more and more progress toward God's pattern of perfection. But what if some people groups did not evolve as far as others, had no divine spark, and could not grasp the gospel of progress? 'The Aboriginal People of Australia, exactly the same race as the African Negro, cannot take in the Gospel,' said Kingsley. 'All attempts to bring them to a knowledge of the true God have as yet failed utterly…Poor brutes in human shape…'.

> "Paton was a humble, godly missionary who knew his Bible and personally knew the people whom Kingsley had labelled 'poor brutes in human shape…'.



Charles Kingsley

John Gibson Paton

"Those racist words of Kingsley upset John Paton, the missionary to the South Pacific islands. Paton was a humble, godly missionary who knew his Bible and personally knew the people whom Kingsley had labelled 'poor brutes in human shape'. What Paton saw among these islanders, he said, would 'shatter to pieces everything that the famous preacher had proclaimed.' Paton told how thousands of cannibals were transformed into wise, loving people by believing the Bible's message of salvation through faith in Jesus. Many went on to be preachers and teachers…They did not need to be dismissed as animals. They just needed Jesus and the Bible. They needed to know that they were created in God's image, that sin had marred God's image in them, and that Jesus had come to save them from their sin.

"Ironically, those who today seem least able to accept the gospel have white skin. Throughout Britain and among North America's intellectual elite, a superstitious faith in evolution blinds many to the gospel. Meanwhile, throughout the world, people with darker skin – far from being too primitive to grasp the gospel – are flocking to Christ by the millions. The apostle Peter was right when he said, 'God does not show favouritism but accepts men from every nation who fear him and do what is right' (Acts 10:34-35, NIV).

"The gospel is the same for all. It begins by teaching that all humans have the same origin: we are descendants of Adam and Eve, created to image God and to rule creation on God's behalf. Our spiritual dimension, our mental ability, our emotions, our capacity for relationships, our position as the crown of creation, even our bodies – all these are part of what it means to be human and to image God… We all have the same origin, and we all have the same problem: 'All have sinned and fall short of the glory of God' (Romans 3:23). We have rebelled against God, defiled and defaced his image in us, and despised and degraded others created in God's image. The Christian gospel also presents us all with the same solution: faith in the perfect life, sacrificial death, and resurrection of Jesus. The gospel embraces rich and poor, genius and mentally disabled, infant and elderly, male and female of every nation or shade of skin. Scripture says we all must be saved through the blood of one man, Jesus Christ, the man who perfectly images God and is himself divine. With his blood, he 'purchased men for God from every tribe and language and people and nation' (Revelation 5:9b)." ■

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This article, abridged by Charles Whitworth, is reprinted from The Banner of Truth website with the kind permission of the author: http://www.banneroftruth.org/pages/home.php. Geoff Thomas is the Minister of Alfred Place Baptist Church in Aberystwyth.

The Foundations of our Faith. 8:

The Doctrine of Last Things

J. H. John Peet

The global flood of Noah points to the final judgment when Christ returns. © 2008 Jens Carsten Rosemann, www.istockphoto.com.

We have seen in this series that the creation account – together with the great catastrophe of the Fall – are essential parts of our wider Christian doctrines. We have considered the nature of God, the nature of man, the Fall and our salvation, and the doctrine of nature. In this final part we see how the second great catastrophe – the Flood in the time of Noah – affects our trust in the doctrine of the end of the present age.

Christ's return itself is linked to the Flood. "As in the days of Noah, so it will be when the Son of Man comes" (Matthew 24:37). If the Flood did not occur, then Christ's words would imply His return wouldn't either!

The global Flood led to the destruction of *all* air-breathing land animals, except those on the ark. It is compared to the final judgment (2 Peter 3). If the Flood was not global, the final destruction will not be global. If the Scriptures are not correct concerning the saving of only those in the ark, then who will be saved at the Lord's coming?

It is significant, as Peter points out, that in these days both the Flood and the return of Christ are doubted.

Hell is now abandoned as **the final judgment** in favour of annihilation. The late James Montgomery Boice (2005, p. 88) said, "The proof of the final judgment is the fact that God has already judged the world once in the great Flood of Noah...The final judgment is no less certain than the former one."

Again, Peter uses the illustration of the judgment at the Flood as a model for the final judgment. The Lord, in His Sermon on the Mount (Matthew 7), warns of those who will be excluded from the eternal bliss because they were not right with God. That, of course, reminds us of the moment that the doors were closed by God on the ark.

The suddenness of the judgment at the Flood is something we see (on a smaller scale) in modern floods. People die in the first moments of the disaster as the waters sweep in. How much more that must have been the case when the Lord opened the fountains of the deep and the windows of heaven. But that will also be the result when the Lord returns: in a moment, in the twinkling of the eye. Modern writings on the Flood – even by evangelicals – display an interesting difference from the Scriptures on this point. The New Testament emphasis is on the suddenness and unexpected nature of the Flood and so of the "day of the Lord."

The Lord's return will be marked by the new creation. Are **the new creation, the new heavens and new earth** an evolutionary utopia? Revelation 21:4 says there will be no tears, death, mourning or pain. What is the significance of this redemption if there was no Fall?

This new creation is what the present creation groans for (Romans 8:19-21). What is the sense of this promise if the account of the creation and the curse is not real? For the people of God, there will be a real 'utopia', the paradise of God in which there will be no sin and so no death, disease, pain or tears. Man will again walk with his God (Genesis 3:8), but will have no need to hide from Him.

Conclusion

We cannot claim to be evangelical in theology *and* believe in molecules-to-man evolution. The two positions are biblically incompatible. Creation and evolution have:

- **different relationships:**

  – who is our nearest relative? In whose image are we formed – ape or God?

- **different links:**

  – man is conscious of a missing link. But, is it between man and the apes ('Lucy') or man and God (Christ)?

Creation means God is able, He cares and He is willing. Creation leads to worship and to humility (Job 42:1-5). You are worthy, O Lord. ■

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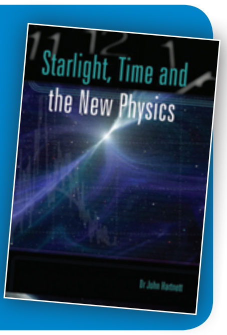
special review article

Starlight, Time and the New Physics

by John Hartnett

Creation Book Publishers, Powder Springs, Georgia, USA. 2007. 232 pp. **£5.50.**
ISBN 987-0-949906-68-7.

Reviewed by William Worraker



Introduction

The subtitle on page 1 of this book, 'How we can see starlight in our young universe', gives a good idea of its main purpose. Those who read Bible history straightforwardly understand that the Earth and the universe at large were created only a few thousand years ago. However practically all agree that we can see stars and galaxies at immense distances, in many cases much too far for their light to have reached us in that time. This 'starlight and time' problem is a serious issue for creationists. Just how serious may be judged from the back cover of John Hartnett's book:

> "This misconception [*i.e. that this problem has no solution*] is often the ultimate stumbling block to a straightforward understanding of the Bible – even the gospel itself."

Several attempts have been made to resolve this issue. Suggestions have included: starlight was created in transit; Genesis 1, in describing the creation of the stars on Day 4 of Creation Week, is speaking phenomenologically, i.e. starlight first reached the Earth on Day 4; light travelled much faster than it does now; events in the distant universe were miraculously speeded up, and so on. All such ideas have major flaws, and none has ever received general assent amongst Bible-believers.

Perhaps the most successful approach to date has been that of US physicist Dr Russell Humphreys (1994, 1998). In the 1990s he suggested that the Earth is near the centre of a finite, bounded universe which has expanded as indicated in a number of Scriptures. His model, based on general relativity, implied that because of the Earth's special location in the cosmic gravitational field, Earth time on Day 4 of Creation Week passed much more slowly than time in the cosmos, allowing starlight to reach Earth by the end of that day. Since the Bible records the passage of time as measured by observers on Earth, this is equivalent to events in the cosmos corresponding to Day 4 of Creation Week taking place extremely rapidly.

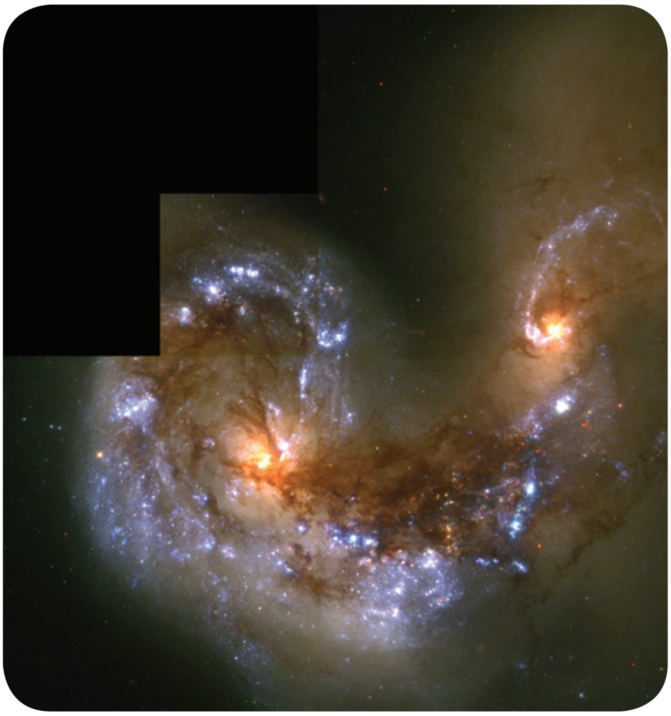
Description

John Hartnett also accepts the Scriptural evidence that the Earth is at the centre of a finite, bounded universe and that God "stretched out the heavens" in creation. In this new book he summarises the contents of a series of articles he has published over recent years in *Journal of Creation* and in the conventional peer-reviewed literature. He introduces a major new cosmological element, namely Israeli physicist Moshe Carmeli's extension of special and general relativity (Carmeli 2006),[1] *cosmological* special and general relativity (CSR and CGR respectively). These involve the velocity of expansion of the cosmos (sometimes known as the 'Hubble flow') as an additional dimension alongside the familiar time dimension and three space dimensions of Einstein's relativity. Just as time in special and general relativity is scaled by the universal constant c, the velocity of light, the cosmic expansion velocity is scaled by the Hubble-Carmeli time constant τ, a measure of the scale of the universe (whose radius is given as $c\,\tau$ = 13.54 billion light years). In place of Einstein's *spacetime,* Hartnett uses the term *spacevelocity* for the 'substance of the universe' viewed at an instant of time, and *spacetimevelocity* when the passage of time is included.

The other key elements in Hartnett's cosmological model are: (1) an expanding universe subject, on Day 4 of Creation Week, to an extremely rapid acceleration which has now stopped; (2) the assumption, which he supports with evidence from recent large galaxy surveys, that the Earth is near the centre of a bounded, finite, spherically symmetric universe. Within this framework, the passage of time on the Earth on Day 4 is much slower than elsewhere in the cosmos; it now passes at the same rate everywhere. This Creation Week time dilation is due to the accelerating expansion rather than to the Earth's central location, which serves only as a small modification. Thus a similar time dilation effect must occur elsewhere in the universe; it is not confined to the Earth or Solar System.[2] In Hartnett's model the implied velocity of light during Day 4 is correspondingly much higher than c (except as it reaches the observer, for whom it is always c), thus allowing plenty of time for starlight to reach the Earth even from billions of light years away. This is Hartnett's solution to the starlight and time problem.

Hartnett claims support for his model from the fact that it correctly predicts the effects generally attributed to dark matter and dark energy: unexpectedly fast rotation of the outer regions of spiral galaxies, unduly rapid motions within galaxy clusters, and an apparent acceleration of the universal expansion as deduced from the brightness-redshift relationship of the supernovae used to gauge the large-scale motion of the universe. In Hartnett's theoretical framework these effects are due to the properties of the physical vacuum, which are implicit in his equations.
He explains that the 'new physics' which he has invoked is, in

Dr John Hartnett, author of *Starlight, Time and the New Physics.*



The Antennae Galaxies (NGC 4038/4039), two colliding stellar systems located 63 million light-years away in the southern constellation Corvus. The galaxies get their name from the pair of long tails of luminous matter which resemble an insect's antennae. © Brad Whitmore (STScI), and NASA.

principle, better science than the usual approach of depending on hypothetical 'dark' entities which have never been observed. To explain the origin of galaxies he proposes that, rather than being formed through the random gravitational interactions of dark matter and associated normal matter in the expanding (big bang) universe as usually assumed, they are the evolutionary products of quasars ejected from the centres of older galaxies. The ejected material, Hartnett suggests, is naturally created in these galactic centres as a natural by-product of energy released in the universal expansion.

Appraisal

Although I cannot vouch for every detail in the book, I found no significant errors of methodology, basic science or mathematical content. Presentation quality and typesetting are generally good, but one error may be more than just a typo: the *barred spiral* galaxies NGC 3198 and NGC 1097 are called *barbed spirals* on pages 171, 174 and 175. In view of the inherently difficult concepts involved, the book is organised for general readability into seven chapters containing very few equations, while the technical details and equations are largely confined to its six appendices. An index would have been helpful to the reader.

What do we make of Hartnett's cosmological model? Can creationists claim that it really solves the starlight and time problem? It appears to succeed where Humphreys' models failed, in that it produces the desired results for the passage of time on the Earth compared with time in the cosmos; when analysed in depth Humphreys' models actually predicted virtually no time dilation effect at all. Furthermore it solves a number of cosmological puzzles (apparently missing mass, cosmic acceleration, etc) much more elegantly than the widely-accepted *hypothetical* entities, dark matter and dark energy. It is thus a good example of Occam's razor, the scientific principle whereby the simplest, neatest explanation is given preference over alternatives.

What questions does Hartnett's model raise, in particular with regard to the region containing the Earth and the Solar System, where time has to pass extremely slowly on Day 4 of Creation Week? I will call this a 'time bubble' for simplicity. How large was it? According to a previous article by Hartnett (2003), it encompassed the Solar System, but that view was not based on a well-formulated theory. The present theory includes as an adjustable parameter the time dilation factor, which determines the size of the time bubble; Hartnett's value gives a radius of around 1-4 light-days, or a few hundred times the Sun-Earth distance, which encompasses the Solar System as we know it.

However, as noted above, time dilation in this model is due primarily to an accelerating expansion. Thus it applies in practically the same way everywhere within the observable universe (certainly within 100 million light years or so). If the Sun, Moon and planets were created within one day of Earth time, the same timescale should apply, for example, to other stars and their planetary systems, indeed to all small-scale astrophysical formation processes, *as measured by local atomic clocks.* Thus, it seems, the creation process itself was, in terms of local time, very rapid everywhere in the universe – fitting perhaps for an omnipotent Creator God who is beyond the constraints of time and space.[3]

A further question relates to the character of the light reaching the Earth from the Sun, Moon, stars and galaxies on Day 4 of Creation Week, together with the light from the unspecified source created on Day 1 (Genesis 1:3-5). There are two competing effects: (1) blueshifting (an increase in photon frequencies and energies, with a corresponding decrease in wavelengths) due to time dilation, and (2) redshifting, together with distance-related intensity reduction, due to the universal expansion. Hartnett has little to say about these in the book, but considers the issues and possible aspects of a solution in a recent article (Hartnett 2005). There are complex related questions which deserve further investigation.

Another question is whether the accelerating expansion postulated for Creation Week will have affected astronomical distances (i.e. stretched them) on smaller than cosmic scales. Hartnett's analysis of galaxy rotation curves employs a fixed critical acceleration level ($\approx 5\times10^{-10}$ m/s^2) to distinguish 'Newtonian' and 'Carmelian' dynamic regimes (which apply above and below this level respectively), and he suggests[4] that this is the level below which Carmelian-based analysis should be used, and therefore in which the cosmic expansion would affect dimensions locally, e.g. in the outer regions of galaxies. This, and no doubt many other questions which Hartnett's theory may raise, also deserves further investigation.

Concluding Remarks

In summary, John Hartnett's new book represents a major step forward in creationist cosmological thinking from the position reached by Russell Humphreys in the 1990s, and may in due course be recognised as a landmark contribution to creation science. Although some time will be needed for the book to be questioned, digested and assimilated by the creationist community, it may prove to be a valuable apologetic resource. Hartnett's theoretical framework allows creation research in cosmology and astrophysics to address more detailed questions, for example the formation of galaxies, the dynamics of galaxy clusters, the interaction history of the Solar System with the rest of the Milky Way galaxy, and so on. It will no doubt lead to further testable predictions, and can thus be checked further. The book deals with inherently difficult concepts in a manner which should be accessible to readers with a serious interest in creation science, to whom I would recommend it as a valuable addition to their bookshelves. ■

Footnotes

1. This book is a summary of previously-published work by Carmeli.
2. This is analogous to the well-known Lorentz contraction of special relativity (SR), whereby observers moving with respect to each other at high velocity (i.e. not many orders of magnitude smaller than c) will deduce that each other's clocks are running slowly, and their distance measures are shorter, than when there is no motion. Thus in SR there is no preferred reference frame, and the same applies in CSR.
3. Although Hartnett insists that time passed on the Earth very slowly during Creation Week, and subsequently caught up to 'normal', an observer on Earth would not have noticed any change in the rate of his own clocks, and the same would apply to a hypothetical observer practically anywhere else. Any observer able to see distant events corresponding to Day 4 of Creation Week would deduce that they took place extremely rapidly, i.e. billions of years of astrophysical work taking place within 24 hours, after which very little happened. Thus it would seem quite legitimate to deduce from Hartnett's theory that Day 4 of Creation Week really only did last 24 hours – Earth time is as good as any other time frame.
4. Hartnett, J.G. (2008), private communication.

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